Express Mail Label No. EV 292567237 US
Attorney Docket No. S1022.81202US00
Mailed: January 14, 2005

In the Claims

Applicant submits below a complete listing of the current claims, with any insertions indicated by underlining and any deletions indicated by strikeouts and/or double bracketing.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims

1. (Currently amended) A TFA image sensor with stability-optimized photodiode for converting electromagnetic radiation into an intensity-dependent photocurrent with an intermetal dielectric, on which, in the region of the pixel matrix, a lower barrier layer ~~(metal 2)~~ is situated and a conductive layer ~~(metal 2)~~ is situated on said barrier layer, and vias being provided for the contact connection to the ASIC, said vias ending in metal contacts on the ASIC, ~~characterized in that~~ wherein an intrinsic absorption layer ~~(i)~~ is provided between the TCO layer and the barrier layer ~~(metal 2)~~ with a layer thickness of between 300 nm and 600 nm.

2. The TFA image sensor as claimed in claim 1, ~~characterized in that~~ wherein the layer thickness of the intrinsic absorption layer ~~(i)~~ is approximately 450 nm.

3. (Currently amended) The TFA image sensor as claimed in ~~claims 1 and 2~~ claim 1, ~~characterized in that~~ wherein the band gap of the intrinsic absorption layer ~~(i)~~ of the photodiode is increased.

4. (Currently amended) The TFA image sensor as claimed in ~~one of claims 1 to 3~~ claim 1, ~~characterized in that~~ wherein the increase in the band gap is realized by using an amorphous silicon-carbon alloy (a-Sic:H) as absorption layer.

5. (Currently amended) The TFA image sensor as claimed in ~~one of claims 4~~ claim 1, ~~characterized in that~~ wherein, in particular, the photodiode of reduced layer thickness is arranged on a surface that is as planar as possible.

6. (Currently amended) The TFA image sensor as claimed in ~~one of claims 1 to 5~~ claim 1, ~~characterized in that~~ wherein the photodiode with small intrinsic layer thickness is deposited on an ASIC having a flat surface topography.

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7. (Currently amended) The TFA image sensor as claimed in ~~one of claims 1 to 6~~ claim 1, ~~characterized in that~~ wherein the ASIC is coated with a passivation.

8. (Currently amended) The TFA image sensor as claimed in ~~one of claims 1 to 7~~ claim 1, ~~characterized in that~~ wherein, within the pixel matrix, firstly the back electrodes of all the pixels are connected to one another via the topmost CMOS metal plane, which is made planar in the region of the pixel matrix.

9. (Currently amended) The TFA image sensor as claimed in claim 8, ~~characterized in that~~ wherein the metal plane is situated on a CMP-planarized surface (CMP = Chemical Mechanical Polishing) of the topmost intermetal dielectric layer.

10. A method for fabricating a TFA image sensor as claimed in ~~one of claims 1 to 9~~ claim 1, ~~characterized in that~~ wherein, before the application of the photodiodes, the topmost, comparatively thick metal layer of the ASIC is removed and replaced by a matrix of thin metal electrodes which form the back electrodes of the photodiodes, said matrix being patterned in the pixel raster.

11. (Currently amended) The method as claimed in claim 10, ~~characterized in that~~ wherein an antireflection layer that is present and the metal layer are completely removed above the pixel matrix, so that all that remains is the barrier layer situated underneath.

12. (Currently amended) The method as claimed in claim 10, ~~characterized in that~~ wherein the lower barrier layer is completely removed, this then being followed by the deposition and patterning of the further metal layer in the form of pixel back electrodes.

13. (Currently amended) The method as claimed in ~~one of claims 10 to 12~~ claim 10, ~~characterized in that~~ wherein the ASIC passivation is opened in the photoactive region of the TFA sensor.

14. (Currently amended) The method as claimed in ~~one of claims 10 to 13~~ claim 10, ~~characterized by the removal of~~ wherein the antireflection layer of the upper metalization layer of the ASIC in the photoactive region of the TFA sensor is removed.

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15. (Currently amended) The method as claimed in ~~one of claims 10 to 14~~ claim 10, ~~characterized by the removal of~~ wherein the conductive layer of the upper ~~metalization~~ metallization layer of the ASIC in the photoactive region of the TFA sensor is removed.

16. (Currently amended) The method as claimed in one of claims 10 to 15, ~~characterized by patterning or removal of~~ wherein the lower barrier layer of the upper ~~metalization~~ metallization layer of the ASIC in the photoactive region of the TFA sensor is patterned or removed.

17. (Currently amended) The method as claimed in one of claims 10 to 16, ~~characterized by deposition and patterning of~~ wherein a further metal layer is deposited and patterned.

18. (Currently amended) The method as claimed in one of claims 10 to 17, ~~characterized by deposition and patterning of~~ wherein further layers, such as color filter layers, are deposited and patterned.

19. A method for fabricating a TFA image sensor as claimed in ~~one of claims 1 to 9~~ claim 1, ~~characterized by~~ wherein

[[- opening of]] the ASIC passivation in the photoactive region of the TFA sensor is opened,

[[- removal of]] the antireflection layer of the upper ~~metalization~~ metallization layer of the ASIC in the photoactive region of the TFA sensor is removed,

[[- removal of]] the conductive layer of the upper ~~metalization~~ metallization layer of the ASIC in the photoactive region of the TFA sensor is removed,

[[- patterning or removal of]] the lower barrier layer of the upper ~~metalization~~ metallization layer of the ASIC in the photoactive region of the TFA sensor is patterned or removed,

[[- deposition and patterning of]] a further metal layer is deposited and patterned,

[[- deposition and patterning of]] the photodiode layers are deposited and patterned,

and

[[- deposition and patterning of]] further layers, such as color filter layers, are deposited and patterned.